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EXAMINER	
TURNER, SAMUEL A	

ART UNIT	PAPER NUMBER
2877	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

felixfischer@fischeriplaw.com

Office Action Summary	Application No. 10/596,101	Applicant(s) BARCELOS ET AL.	
	Examiner SAMUEL A. TURNER	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8, and 10-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 7 October 2008 have been fully considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Claims 5, 14, and 17 are objected to under 37 CFR 1.75(c).

In claim 5 there is no antecedent basis for "the optical modulators installed in the interferometer arms". Claim 2 provides antecedent basis for -at least one optical modulator- which is specifically located in the reference path.

Claim 14 references two "fourth optical paths". The second "fourth optical path" should be -the fifth optical path-.

In claim 17 there is no antecedent basis for "the optical modulators installed in the interferometer arm". Claim 1 provides antecedent basis for -a modulator- specifically located in the reference path.

Claim Rejections - 35 USC § 112, second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12 and 13 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 12 and 13 are confusing because the claims are directed to construction of the modulator but list various ways a modulator would produce modulation in a signal.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4-8, 11, and 14-17 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ziegler et al(WO 03/060458).

With regard to claim 1, Ziegler et al teach a system for measurement of optical parameters and characterization of multiport optical devices(**Fig. 2**) comprising at least one tunable laser source(**Fig. 2, 70**) responsive to a process control system(**page 3, lines 1-4**) and providing an optical signal to an optical interferometer(**Fig. 2, 200**), the interferometer splitting the optical signal into a first optical signal and a second optical signal(**Fig. 2, 281**), the interferometer connected to a port of a device under test(**Fig. 2, 6**) receiving the first optical signal through a path of the interferometer(**Fig. 2, 86**) and a modulator(**Fig. 2; 12,203; page 5, lines 23-28**) receiving the second optical signal on a second path of the interferometer(**Fig. 2, 2**), an optical detection system connected to the optical

interferometer for heterodyning the first optical signal and modulated second optical signal for transmission to a data acquisition circuit**(Fig. 2; 206,208)**.

With regard to claim 2, Ziegler et al teach a method for measurement of optical parameters and characterization of multiport optical devices-comprising the steps of providing at least one laser source**(Fig. 2, 70)**, splitting a signal from the laser source into two optical paths**(Fig. 2, 281)**, inserting in a first of the two optical paths a device under test (DUT) **(Fig. 2, 6)**, inserting in a second of the two optical paths at least one optical modulator forming an interferometer**(Fig. 2; 12,203)**, summing the signals of both paths at a same photodetector thereby translating to the electric domain by heterodyning of the optic signals, which contain the information of the optical reflection characteristics of the DUT**(Fig. 2; 206,208)**.

As to claim 4/2, Ziegler et al teach the steps of combining an optical output signal from the device under test with an optical output signal of the modulator to form a second interferometer**(Fig. 2; 206,208)**, summing the optical output signal from the device under test and the optical output signal from the modulator in a second photodetector thereby translating to the electric domain by heterodyning of the optical signals containing the information of the optical transmission characteristics of said device under test**(Fig. 2; 206,208)**.

As to claim 5/4, Ziegler et al teach the step of determining the polarization characteristics of the DUT for two orthogonal polarization modes of light, the

polarization discrimination being provided by the optical modulators installed in the interferometer arms**(page 5, lines 23-28)**.

As to claim 6/2, Ziegler et al teach the step of describing the transfer function of the optical signals between the diverse ports of the DUT by means of the optical "S"-parameters where each "Sxy" parameter is represented using the formalism of Jones (Jones matrix) and/or the formalism of Müller (Müller matrix) and where all the determinations of the optical characteristics of the DUT are based on said "Sxy" parameters**(page 5, lines 23-28)**.

As to claim 7/4, Ziegler et al teach the step of measuring different optical parameters in the different propagation paths by the arrangement of the optical circuits of the interferometers according to selected optical configurations, each individual configuration corresponding to the measurement of a specific optical "S"-parameter of interest**(page 5, lines 23-28)**.

As to claim 8/7, Ziegler et al teach wherein the optical circuits of the interferometers are obtained by overlapping several individual optical configurations related to the simultaneous measurement of several optical "S"-parameters**(Fig. 2)**.

As to claim 11/1, Ziegler et al teach wherein the optical interferometer incorporates physical paths for propagation and conduction of the optical signal, selected from the set of optical fibers, planar waveguides, and free space optics(FSO)**(Fig. 2)**.

As to claim 14/1 Ziegler et al teach wherein the optical interferometer comprises a first optical path**(Fig. 2, 80-f1)**, an optical coupler**(Fig. 2, 82)** connected to the first optical path and splitting the optical signal into the first optical signal provided through a second optical path**(Fig. 2, 86)** to an input port of the device under test**(Fig. 2, 6)** and the second optical signal provided through a third optical path**(Fig. 2, 2)** to the modulator**(Fig. 203; page 5, lines 23-28)**, a fourth optical path connected to the modulator for transmission of a modulated optical signal for reflection from a mirror**(Fig. 2, 12, 203)** and returned through said optical coupler, said first optical signal being reflected from said device under test and returned through said optical coupler, a fourth optical path**(Fig. 2, 208)** connected to said optical coupler and receiving the reflected modulated signal and the reflected first optical signal for heterodyning the reflected first optical signal and modulated optical signal.

Claim 14 now includes a limitation to a mirror which met by Ziegler et al. The subject matter is found in EP-A-01118179 figure 4 and published as Ziegler et al(EP 1202038) and corresponds to Stolte et al(2003/0020900) cited in the office action dated 7 July 2008. This subject matter was incorporated by reference into Ziegler et al(WO 03/060458) and is therefor part of the disclosure.

As to claim 15/1 Ziegler et al teach wherein the optical interferometer comprises a first optical path**(Fig. 2, 80-f1)**, an optical coupler**(Fig. 2, 82)** connected to the first optical path and splitting the optical signal into the first optical signal

provided through a second optical path(**Fig. 2, 86**) to an input port of the device under test(**Fig. 2, 6**) and the second optical signal provided through a third optical path(**Fig. 2, 2**) to the modulator(**Fig. 203; page 5, lines 23-28**), a fourth optical path connected to the modulator for transmission of a modulated optical signal(**Fig. 2, 2**), a second optical coupler(**Fig. 2, 83**), a fifth optical path connected to an output port of the device under test and the second optical coupler(**Fig. 2, 86**), said first optical signal being transmitted through said device under test and returned through said second optical coupler, a sixth optical path(**Fig. 2, 206**) connected to said second optical coupler and receiving the modulated optical signal and the transmitted first optical signal for heterodyning the first optical signal and modulated optical signal.

As to claim 16/2, Ziegler et al teach the step of measuring different optical parameters in the different propagation paths by the arrangement of the optical circuits of the interferometer according to selected optical configurations, each individual configuration corresponding to the measurement of a specific optical "S"-parameter of interest(**page 5, lines 23-28**).

As to claim 17/2, Ziegler et al teach the step of determining the polarization characteristics of the DUT for the two orthogonal polarization modes of light, the polarization discrimination being provided by the optical modulators installed in the interferometer arm(**page 5, lines 23-28**).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ziegler et al(WO 03/060458).

As to claim 12/1 Ziegler et al **fail to teach** wherein the modulator is constructed by use of techniques selected from the set of refractive index change, acousto-optic effect in crystals, length propagation changes, and electro-optic effect.

As to claim 13/11, Ziegler et al **fail to teach** wherein the modulator is constructed by use of techniques selected from the set of refractive index change, acousto-optic effect in crystals, length propagation changes, and electro-optic effect.

CLAIMS 12 and 13:

Ziegler et al teach a modulator 203 located in element 12, however Ziegler et al fail to specify the type of modulator used.

Official notice is taken that optical modulators which work by refractive index change, acousto-optic effect in crystals, length propagation changes, and

electro-optic effect are all notoriously well known in the art. See In re Malcom, 1942 C.D 589; 543 O.G. 440.

If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the next Office action will indicate that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate.

With regard to claims 12 and 13, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use any known type of modulator. The motivation would have been based on the optical system(bulk optic, fiber, or integrated waveguide), the frequency, and the modulation depth. Substituting one known arrangement for another is obvious when it does no more than yield predictable results, see KSR v. Teleflex 82 USPQ2d 1385 (U.S. 2007).

Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ziegler et al(WO 03/060458) in view of VanWiggeren et al(2003/0223073).

As to claim 3/2, Ziegler et al **fail to teach** wherein the at least one tunable laser source employs stepped wavelength sweeping.

CLAIM 3:

VanWiggeren et al teach that for DUT systems the tunable light source may be swept or stepped.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ziegler et al by stepping the tunable source instead of sweeping the source. The motivation for this modification is found in VanWiggeren

et al which teaches that stepping the tunable source is equivalent to sweeping the tunable source. Choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success would have been well within the scope of the skilled artisan and therefor would have been an obvious matter of choice in design. KSR v. Teleflex 82 USPQ2d 1385 (U.S. 2007).

Claims 10 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ziegler et al(WO 03/060458) in view of Baney et al(2003/0174338).

As to claim 10/4, Ziegler et al **fail to teach** the step of stabilizing the optical circuits of the interferometer against thermal variations or mechanical vibration by providing an additional interferometer operating within the optical test circuits, functioning in a wavelength falling outside the test wavelength band, and operating according to wavelength division multiplexing (WDM) techniques.

As to claim 18/2, Ziegler et al **fail to teach** the step of stabilizing the optical circuits of the interferometer against thermal variations or mechanical vibration by providing an additional interferometer operating within the optical test circuits, functioning in a wavelength falling outside the test wavelength band, and operating according to wavelength division multiplexing (WDM) techniques.

CLAIMS 10 and 18:

Baney et al teach the addition of a fixed source(108) outside the bandwidth of the tunable laser source(46)(**paragraph[0055]**), a coupler(116) with filters(118,120) that separate the fixed source from the tunable laser source, and a processor(128)

connected to a controller(138) and a piezoelectric cylinder that offsets fluctuations due to vibrations(**paragraph[0063]**). Compensation for vibration can also be performed by electronic filtering(**paragraph[0055]**) and computer processing(**paragraphs[0056]-[0058]**).

With regard to claims 10 and 18, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ziegler et al by adding a fixed source, outside the bandwidth of the tunable laser source, at coupler 281; and coupling out the fixed frequency signals at the detectors 206 and 208 with filters. The singles can alternatively be filtered and processed electronically. The motivation for this modification is found in Baney et al which teaches the advantages of removing vibrational noise from the DUT measurements to improve single quality(**see Baney et al, figures 8-11**).

Applicant's arguments with respect to the rejection of claims 1-8, and 10-18 have been considered and are not persuasive, see pages 9 and 10 of Applicant's remarks.

With regard to claims 1 and 2, Applicant has amended the claims to specifically claim the modulator in the reference path of the interferometer. The modulator 203 located in the element 12 meets this limitation.

With regard to claim 2, Applicant has amended the claim to recite only stepped wavelength sweeping. As shown by the rejection of claim 2 above, stepped wavelength sweeping would have been an obvious modification of Ziegler et al.

With regard to claim 5, Applicant argues that Ziegler et al has a polarization controller while the instant invention does not require the component. Nothing in claim 5 would restrict the use of a polarization controller. Ziegler et al, which has the modulator located in element 12 in the reference path of the interferometer, detects the Stokes matrix elements S_{xy}. The Stokes matrix elements are distinguished from each other by detecting the modulation frequency f_3 from the modulator 203. See the values for S_{11}-S_{22} on page 5. Applicant argues that the S_{xy} values claimed differ from the S_{xy} values detected by Ziegler et al. Everything in applicants disclosure indicates that the S_{xy} values are the transmission and reflection parameters. These parameters are measured at the detectors(42,43) and demodulated blocks(50,50') to obtain the demodulated S_{xy} parameters. This is met by Ziegler et al wherein the Stokes matrix elements are derived form the coding frequencies.

With regard to claim 6, the relationship between the Stokes vector elements and the Müller matrix to describe the reflection and transmission polarization characteristics of an element are given in the prior art and would be inherent in the Ziegler et al reference which determines the characteristics of the DUT over the frequency range of the tunable source. The citation from Optical Physics by Lipson et al is added only as directly corresponding evidence to support the prior common knowledge finding, and does not result in a new issue or constitute a new ground of rejection. See MPEP § 2144.03(D).

Action Made Final

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Relevant Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ziegler et al(EP 1202038), see figure 4; and Lipson et al, see page 126.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Samuel A. Turner/
Primary Examiner
Art Unit 2877